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I. '376 Patent

A. “some fading margins (M_1, M_2, \dots, M_N)”

1. The Claims Require More Than One Fading Margin

As a matter of plain English, “some fading margins (M_1, M_2, \dots, M_N)” means more than one fading margin. The plural form of a noun generally refers to two or more. *Leggett & Platt, Inc. v. Hickory Springs Mfg. Co.*, 285 F.3d 1353, 1357 (Fed. Cir. 2002). Plaintiff contends that the Federal Circuit has “‘recognized that, *in context*, the plural can describe a universe ranging from one to some higher number, rather than requiring more than one item.’” Resp. at 4 (*quoting Versa Corp. v. Ag-Bag Int’l Ltd*, 392 F.3d 1325, 1330 (Fed. Cir. 2004)).¹ But, here, the context confirms that “some fading margins (M_1, M_2, \dots, M_N)” requires more than one fading margin.

First, “fading margins” is expressed in the plural throughout the claim, confirming the requirement of more than one fading margin. *See, e.g., GREE, Inc. v. Supercell Oy*, 2020 WL 6559435, at *7 (E.D. Tex. Nov. 6, 2020) (“stack of virtual cards plainly has a plurality of cards” when “the term ‘cards’ is expressed in the plural” and “the surrounding claim language further dictates that the stack of cards has more than one card”). The use of the word “some” does not compel a different result. *OptoLum, Inc. v. Cree, Inc.*, 336 F. Supp. 3d 571, 592 (M.D.N.C. 2018), is inapposite. In *OptoLum*, the parties stipulated that a “plurality” of “light sources” meant “two or more.” *Id.* The dispute thus concerned the meaning of “some of” in the claim’s later recital of “at least *some of* said solid state light sources.” *Id.* The court concluded, “[I]t logically follows that ‘some’ of ‘two or more’ must be one or more.” *Id.* Here the claim context is different, and there is no corollary “plurality” construction. The claim recites “estimating some fading margins (M_1, M_2, \dots, M_N)” and then “the fading margins” are used in “establishing a ... SIR_{target} .” The

¹ Emphasis added in *bold italics* throughout unless otherwise specified.

claim does not recite “at least some of the two or more fading margins”.

Second, the notation (M_1, M_2, \dots, M_N) listing elements 1, 2, through N means more than one in a set. The specification consistently uses this notation throughout with respect to “fading margins”, “fading margin constants”, and “outage probabilities.” *See, e.g.*, ’376 Patent, 10:53–58 (“($SIR_{\text{outage-tgt}}$) is a summation of said fading margins (M_1, M_2, \dots, M_N) weighted or multiplied by some appropriate fading margin constants (K_1, K_2, \dots, K_N) ... $k_1 \cdot M_1 + k_2 \cdot M_2 + \dots + k_N \cdot M_N$.”). A POSITA would recognize this notation and understand that it requires a set including more than one “fading margin”. In fact, all examples from the specification require more than one fading margin. *See e.g., United Cannabis Corp. v. Pure Hemp Collective Inc.*, 2020 WL 376508, at *3 (D. Colo. Jan. 23, 2020) (“cannabinoids” means more than one cannabinoid because “[t]he only examples provided in the specification are examples that obviously, or at least most naturally, demand more than one cannabinoid”). Plaintiff cites to a description where all “fading margin constants” are set to zero except one (Resp. at 3 (quoting ’376 Patent, 10:51–58)). But this does not demonstrate that only a single fading margin is claimed. In this very example cited by Plaintiff, multiple fading margins were still considered in the original calculation of the SIR_{target} as “a linear **combination**” or “summation of said margins.”—i.e. adding fading margins together. ’376 Patent, 10:51–58. Further yet, the very next paragraph explains that this example upon which Plaintiff relies is from the inventor’s former work (ES 200202947) and differs from the claimed invention, which needs to “contemplate all propagation conditions” using a neural network to “adapt to the propagation conditions in real communications environments.” ’376 Patent, 11:1-6. **Critically**, the claims are directed to this alleged improvement because they recite “establishing a target desired signal to interference ratio (SIR_{target}) ... based on ... the fading margins ... by means of a dynamic adjusting function.” *See id.* at Cl. 1. The only “dynamic adjusting function” in the specification

is a “neural network,” and in order to “adapt to the propagation conditions in real communications environments” more than one outage probability and fading margin must be used. *Id.*, 10:32-40 (“[B]ecause it is not possible to maintain the outage probability constant for all propagation conditions,” it is required “that ***not only one*** outage probability and therefore only one associated fading margin are considered.”). A “dynamic adjusting function” between a single outage probability and a target block error rate finds no support in the specification or claims.

Put simply, the entire context of the ’376 Patent is consistent with the term’s natural reading that “some fading margins (M_1, M_2, \dots, M_N)” means more than one fading margin.

2. Defendants’ “fading margin” Construction Is Correct

Plaintiff concedes – as it must – that the ’376 Patent discloses that a “fading margin” (singular) is the “margin (in dB) above the SIR median required to comply with the quality of service (QoS) for a specific link” as set forth in Defendants’ construction. Resp. at 5 (“The ’123 Patent, relied on by Defendants, teaches that fading margins may be the ‘margin above the SIR median...’ as specified in Defendants’ construction.”). Plaintiff wrongly contends that Defendants’ construction is improper because it fails to also *encompass* “second-order statistical moment values (such as the typical deviation) which are dynamically estimated” and a “value of the required margin ... above the median of its probability density function.” *Id.* at 5-6.

First, the ’123 Patent does not disclose that the fading margin encompasses “second-order statistical moment values (such as the typical deviation) which are dynamically estimated” as Plaintiff suggests. Resp. at 5-6. Rather, the statistical moment values that are dynamically estimated reflect the environmental conditions **for which** a fading margin is determined, not the fading margin itself. ’123 Patent, 3:40-47 (fading margin can be obtained “for second-order statistical moment values ... compatible with the various fading conditions that characterize the environment”). That the fading margin does not “encompass” these values is consistent with the

'376 Patent claims, which recite that the fading margins are “associated with” (not that they “include”/“encompass”) “the fading parameters in the channel”. *See* '376 Patent, 14:53-55 (cl. 1).

Second, the '123 Patent's reference to “the value of the required margin ($M_{\text{SIR}}(\text{dB})$) above the median of its probability density function” ('123 Patent, 3:52-53) does not refer to something additional that the fading margin may encompass as Plaintiff suggests. Resp. at 6. Rather, the passage refers to “*its* probability density function”, with “its” referring to the “SIR median” (not the fading margin), which is expressly recited in Defendants' construction.

Third, Plaintiff fails to establish how the cited passage from the '123 Patent translates into Plaintiff's construction. Unlike Defendants' construction, Plaintiff identifies no support in the record for a fading margin being “a difference (in dB) in a statistical distribution of the fading parameters between the value at an outage probability and a specific performance threshold.”

B. “some outage probabilities ($p_{\sigma 1}, p_{\sigma 2}, \dots, p_{\sigma N}$)”

The parties' only dispute is whether “some outage probabilities ($p_{\sigma 1}, p_{\sigma 2}, \dots, p_{\sigma N}$)” requires multiple “outage probabilities” or whether one outage probability suffices. For at least the same reasons stated above for fading margins, multiple “outage probabilities is required.

Plaintiff quibbles that Defendants' string citations “do not provide any examples of the *calculation* of a signal to interference ratio at all.” Resp. at 7 (criticizing cite to, e.g., '376 Patent, 5:56-65 (“*establishing* a target desired signal to interference ratio ($\text{SIR}_{\text{target}}$) for the outer loop, based on ... the estimated fading margins associated with the **outage probabilities** considered.”)). The very next sentence of the disclosure states, “The target desired signal to interference ratio ($\text{SIR}_{\text{target}}$) is *calculated* ... based on the outage probabilities.” '376 Patent, 5:66-6:6.

As discussed above, the specification is clear that multiple outage probabilities and fading margins are needed. *See supra*, at 2-3. Plaintiff contends that Defendants “ignore [that] the choice of a given outage probability ... is dependent on the particular operating conditions for a given

cell ... [and a]s such, the sentence relied on by Defendants' [sic] does not require the use of multiple outage probabilities in all given areas at all particular times." Resp. at 8. This argument, as illustrated by the lack of citation, finds no support in the claim language or specification. The point of the claimed outer loop power control method is to estimate a target desired signal to interference ratio taking into account multiple outage probabilities in addition to the conventional target block error rate "so that the power is adapted to the propagation conditions of the data signal." '376 Patent, 14:44-67. The specification teaches that "it is of interest to include the greatest variety possible of propagation conditions for taking data, the purpose being to minimize the global error made in the greatest *number of possible environments*." *Id.* at 13:6-10. In other words, for the power to adapt to the propagation conditions of the data signal received, multiple outage probabilities need to be considered. Plaintiff's single outage probability interpretation would also render the "dynamic adjusting function" aspect of the claimed invention meaningless.

C. "by means of a dynamic adjusting function which performs a mapping between a quality criterion based on the outage probabilities ($p_{\sigma 1}, p_{\sigma 2}, \dots, p_{\sigma N}$) and the quality criterion based on the target block error rate ($BLER_{target}$)"

Plaintiff relies on *Robert Bosch, LLC v. Snap-On Inc.*, 769 F.3d 1094, 1099 (Fed. Cir. 2014), to assert that the use of "by means of" does not invoke the presumption that section 112, ¶6 applies. Defendants addressed this case at pages 8-9 of their Opening, noting that the Court found, as is the case here, that any presumption against invoking § 112, ¶6 was overcome because the claim limitation failed to recite sufficiently definite structure for performing the claimed function.

Plaintiff argues that a POSITA would understand that the claim recites a "mapping algorithm" and "a particular mapping" reflecting "the *specified structure* of the dynamic adjusting function" and so § 112, ¶6 does not apply. Resp. at 10-11. But the claim requirements following the "dynamic mapping function" are not structure, let alone sufficiently definite structure such that § 112, ¶6 does not apply. *Williamson v. Citrix Online, LLC*, 792 F.3d 1339, 1348 (Fed. Cir. 2015).

The claims recite only that the dynamic adjusting function “performs a mapping between a quality criterion based on the outage probabilities ($p_{\sigma 1}, p_{\sigma 2}, \dots, p_{\sigma N}$) and the quality criterion based on the target block error rate ($BLER_{target}$).” The quoted language is pure function reciting what parameters are mapped and not structure that does the mapping nor an algorithm for performing mapping.

Plaintiff also argues that even if § 112, ¶6 applies, the corresponding structure would be at most a “subset of that neural network in the form of an adder.” Resp. at 11. However, the proper structure is that which the specification clearly links to the recited function, and the ’376 Patent clearly links the “mapping” function to the neural network, not an adder:

A preferred implementation of the function which does the *mapping* between a quality criterion based on the outage probabilities ($p_{\sigma 1}, p_{\sigma 2}, \dots, p_{\sigma N}$) and the quality criterion based on the target block error rate ($BLER_{target}$), which characterizes the method of the invention *is the neural network* (500) shown in FIG. 5

’376 Patent, 11:30-35. *See Williamson*, 792 F.3d at 1352 (“Structure disclosed in the specification qualifies as ‘corresponding structure’ if the intrinsic evidence clearly links or associates that structure to the function recited in the claim.”) (citation omitted).

II. ’865 Patent

A. “setting a desired signal to interference ratio target (SIR_{target}) that is close to a signal to interference ratio required (SIR_{req}) during the normal mode of the outer loop”

Plaintiff concedes that “close to” is a term of degree (Resp. at 13), yet Plaintiff and its expert fail to identify any objective measure for a POSITA in the specification or prosecution history to measure that degree.² The limitation is indefinite, and the asserted claims are invalid.

First, the ’865 Patent (including the cited Chi and Holma prior art upon which Plaintiff

² Plaintiff never acknowledges the Federal Circuit standard regarding the definiteness of terms of degree. Instead, Plaintiff criticizes Defendants for “largely rely[ing]” on the unpublished Federal Circuit *GE Lighting* decision that is “non-precedential.” Resp. at 15-16. Defendants cite to *GE Lighting* only for its summary of the Federal Circuit standard. *See* Defs. Op. at 11.

and Dr. Akl rely) provides only non-limiting examples of the operation of the normal mode³ and no objective measure for a POSITA to judge whether the SIR_{target} is “close to” the SIR_{req} . Disclosure of “non-limiting examples” of the normal mode “does not relieve the patentee from informing, ‘with reasonable certainty, those skilled in the art about the scope of the invention.’” See Memorandum Opinion and Order, *CA, Inc. v. Netflix, Inc.*, Case No. 2:21-CV-00080-JRG-RSP, Dkt. 164, at 30 (E.D. Tex. Nov. 16, 2021) (citation omitted). Non-limiting examples of “normal mode” operation “do not on their own expressly define the bounds—the limits” of a claim that requires the SIR_{target} be set “*close to* a signal to interference ratio required (SIR_{req}) during the normal mode of the outer loop.” See *id.* at 29 (citing *IQASR LLC v. Wendt Corp.*, 825 F. App’x 900, 907 (Fed. Cir. 2020)). “The question is not whether the specification enables a person of ordinary skill in the art to practice the invention, but whether a person of ordinary skill can discern the boundaries of the claims with reasonable certainty.” *Id.* Here, neither Plaintiff nor Dr. Akl offers any discernable boundaries with reasonable certainty for the “close to” limitation.

Second, Plaintiff’s analysis renders the requirement that the SIR_{target} be set “close to” the SIR_{req} meaningless. Essentially, Plaintiff argues that any time the outer loop power control operates in the “normal mode” then *per se*, the SIR_{target} is set “close to” the SIR_{req} . See, e.g., Resp. at 14-15 (arguing operating in normal mode to maintain performance criteria sets SIR_{target} close to SIR_{rec}); Akl Decl. at ¶ 56 (“[A] person having ordinary skill in the art would readily recognize that Holma and Chi describe a commonly-used mechanism for managing the SIR_{target} value in normal mode.”). Accepting Plaintiff’s circular position rewrites the claim (as shown in strike through) to require only “**setting a desired signal to interference ratio target (SIR_{target}) that is close to a**

³ This is reflected in the parties’ agreed construction of “normal mode”: “mode of outer loop power control that occurs when neither a wind-up condition nor an unwinding condition is present.” Defs. Op., Appendix A.

signal to interference ratio required (SIR_{req}) during the normal mode of the outer loop,” as there is no instance under Plaintiff’s theory when the SIR_{target} would not be set close to the SIR_{req} “during the normal mode of the outer loop.” This, by itself, renders Plaintiff’s construction improper. *Innova/Pure Water v. Safari Water Filtration Sys., Inc.*, 381 F.3d 1111, 1119 (Fed. Cir. 2004) (construction improper that renders the term “operatively” in “operatively connected” “unnecessary and superfluous as the patentee could have easily used the term ‘connected’ alone”).

Third, Plaintiff’s criticism of Defendants’ comparison of the use of “suitably close to” in claim 2 (in a different the context) with “close to” in claim 1 highlights Plaintiff’s flawed approach to terms of degree. It is possible for a POSITA to understand the use of “close to” in one context and not in another, because a POSITA must look to the specification and the prosecution history for the objective measure for judging the individual term, something Plaintiff fails to do here.

B. “outer loop wind-up”

The parties agree that the outer loop wind-up is the condition or mode where error rate requirements would dictate repeated increases in the signal to interference ratio target (SIR_{target}), and the only disagreement is whether the condition requires that the desired signal to interference ratio received (SIR_{rec}) will not be able to follow the increases to the signal to interference ratio target (SIR_{target}). The specification is clear that outer loop wind-up occurs when the SIR_{rec} will not be able to follow the increases to the SIR_{target} . Plaintiff’s construction is incomplete and covers conditions that are not outer loop wind-up (*e.g.*, the normal mode).

Plaintiff’s construction is broad enough to cover instances when wind-up is not occurring. For example, Plaintiff’s construction would include the situation where the SIR_{rec} *is able to follow* increases to the SIR_{target} . This certainly cannot be right, as the ’865 Patent makes clear that in outer loop power control “normal mode”, the SIR_{rec} can follow variations in the SIR_{target} where “the inner loop helps to maintain the desired signal to interference ratio received (SIR_{rec}) close to the

target (SIR_{target}).” ’865 Patent, 4:31-34; 2:33-42. If the SIR_{rec} was able to follow the SIR_{target} , the quality of communication would be maintained and wind-up would not be an issue.

Plaintiff argues that the specification “more generally explains that the ‘outer loop wind up’ occurs based on the error rate requirements.” Resp. at 17-18. Plaintiff cites to a portion of the specification describing an embodiment where outer loop wind-up is detected when a detection margin (M) between SIR_{target} and the SIR_{rec} has been exceeded. *Id.* at 17 (citing ’865 Patent, 7:53-59). Yet, this embodiment falls within Defendants’ construction, and therefore, does not support Plaintiff’s incomplete construction. That is, as is clear from FIG. 4 of the ’865 Patent, the reason the detection margin (M) is exceeded – and wind-up is detected – is because in part the “Measured SIR” is not following the “Target SIR”. *See* ’865 Patent, FIG. 4 (showing “Measured SIR” diverging from “Target SIR” such that at point 402 the “Wind-up detection margin” is exceeded).

Plaintiff contends that prior art reference Chi teaches that two successive increases in the SIR_{target} constitutes a detection of outer loop wind-up. Resp. at 18. Not so. Consistent with the ’865 Patent, Chi explains that “Wind-up ... occurs when the outer loop continually raises the target SIR by the up step size, and the inner loop requests more power, **but the received SIR does not increase correspondingly.**” Chi at [0035]. Plaintiff’s reliance on Fig. 8 of Chi is misplaced. Resp. at 18. As Chi explains and Plaintiff carefully omits, Fig. 8 shows that wind-up occurs during a “period of time where the measured SIR **does not track** the target SIR” when “target SIR would be greater than the measured SIR plus the ‘Wind-up detection margin’” Chi at [0040]. Two successive increases in the SIR_{target} without the measured SIR not tracking the target SIR simply does not reflect the wind-up condition. *See, e.g.,* Chi, Fig. 5 and [0035] (identifying wind-up condition after outer loop “raises the target SIR six times”).

Plaintiff advances a construction blurring the distinction between the normal mode and

wind-up. The intrinsic evidence demonstrates that Defendant's construction is the right one.

C. “wherein at the start (403) of the outer loop unwinding the desired signal to interference ratio target (SIR_{target}) is set to a value suitably close to the original value (401) set just before the start moment (402) of the outer loop wind-up”

Plaintiff first attempts to sidestep the issue by arguing that the breadth of dependent claim 2 is a “premature request for summary judgment” and not an issue of “claim construction.” Resp. at 19-20. However, dependent claim 2's failure to specify a further limitation on claim 1 from which it depends, and its non-compliance with § 112, ¶ 4, is an issue of claim construction. *See Multilayer Stretch Cling Film Holdings, Inc. v. Berry Plastics Corp.*, 832 F.3d 1350, 1356 (Fed. Cir. 2016) (reviewing claim construction order holding improper dependent claim invalid).

On the substance, Plaintiff obfuscates the issue by reciting the claims without the benefit of the parties' agreed construction. The parties agreed that claims 1 and 5 should include the underlined language: “wherein the desired signal to interference target (SIR_{target}) is modified at the start (403) of the outer loop unwinding, to match it to the signal to interference ratio target (SIR_{target}) in outer loop power control in normal mode just prior to the start of the outer loop wind up.” Defs. Op., Appx. A. With that agreed construction, it is clear that Plaintiff does not address the merits of Defendants' argument, *i.e.*, Plaintiff made no attempt to show how the SIR_{target} can be both “match[ed]” to the SIR_{target} just prior to the start of the outer loop wind up (as required by claim 1) **and** at the same time “suitably close to” the SIR_{target} just before the start of the outer loop wind up (as required by claim 2).⁴ It cannot. As Defendants explained and Plaintiff did not rebut, being “suitably close” encompasses a wider range of possible values for the SIR_{target} than the narrower requirement of “matching” the SIR_{target} value. *See* Defs. Op. at 17 (“match” is equal or as close as possible). Dependent claim 2 broadens, rather than narrows, and thus is invalid.

⁴ Plaintiff makes no argument that there is some narrowing effect through claim 2's use of the phrase “just before” as opposed to claim 1's “just prior to”.

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Respectfully submitted,

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CERTIFICATE OF SERVICE

I hereby certify that on December 2, 2021, I electronically filed the foregoing with the Clerk of Court using the CM/ECF system, which will send notification of such filing to all counsel of record.

/s/ Gilbert A. Greene

Gilbert A. Greene